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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,034	03/05/2002	Nicholas Charles Nahas		3878

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EXAMINER

PATEL, VINIT H

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/090,034	Applicant(s) NAHAS, NICHOLAS CHARLES	
	Examiner Vinit H. Patel	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soung, U.S Patent No. 4,459,138 in view of Leas, U.S. Patent No. 5,855,631 and in further view of Koh et al, U.S. Patent No. 4,094,650.

Regarding claim 1, Soung discloses a process for the production of methane from carbonaceous solids comprising sufficient alkali metal-containing solution, such as potassium or cesium or mixtures thereof (C1/L 25-30), be introduced into the feed preparation zone 14 to provide from about 3 to about 50 weight percent of the alkali metal compound (therefore less than about 50% of petroleum coke and other inorganics) or mixture of such compounds on the carbonaceous solids. The hot gas, supplied through line 20, serves to heat (a preheating step in the preparation zone) the impregnated solids and drive off the moisture. The dried impregnated solid particles prepared in zone 14 are withdrawn through line 24 and passed to a closed hopper or similar vessel 25. From here they are discharged through a star-wheel feeder or equivalent device 26 in line 27 at an elevated pressure sufficient to permit their entrainment into a stream of high-pressure steam, recycle product gas, inert gas, or other carrier gas introduced into line 29 via line 28. The carrier gas and entrained solids

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are passed through line 29 into manifold 30 and fed from the manifold through feed lines 31, and nozzles, not shown in the drawing, into gasifier 32 (C3/L15-19).

Gasifier 32 comprises a refractory lined vessel containing a fluidized bed of carbonaceous solids extending upward within the vessel above an internal grid or similar distribution device not shown in the drawing. The bed is maintained in the fluidized state by means of steam introduced through line 33, manifold 34 and peripherally spaced injection lines and nozzles 35 and by means of recycle hydrogen and carbon monoxide introduced through bottom inlet line 36 (flowing upwardly) (C4/L17-58).

The injected steam reacts (preheated) with carbon in the feed material in the fluidized bed in gasifier 32 at a temperature within the range between about 425.degree. C. (approx 797 degree F.) and about 870.degree. C. (approx. 1598 degree F.), at a pressure between about 7.0 and about 140 kg/cm.sup.2 (approx. 99 to 1991 psig) (C4/L47-54).

The gas withdrawn from the upper part of the gasifier through line 37 will normally contain methane, carbon dioxide, hydrogen, carbon monoxide, un-reacted steam, hydrogen sulfide, ammonia, and other contaminants formed from the sulfur and nitrogen contained in the feed material, and entrained fines (C5/L16-22). The remaining gas, consisting primarily of methane, hydrogen and carbon monoxide, may be cryogenically separated into a product methane stream and a recycle stream of hydrogen and carbon monoxide which is returned to the gasifier through line 36 (C5/L36-41).

Soung does not disclose the step of preheating the petroleum residua to a temperature of between 300 –800 degree F and the gaseous mixture fluidizing the particles comprising more than 50% steam, more than 20%-40% hydrogen, and more than 3%-20% carbon monoxide wherein the mass flow rate is between 1.8-2 times the mass flow rate of the preheated feedstock and wherein the hourly mass flow of the feedstock is between 0.3 – 0.6 times the mass of the alkali metal.

Leas discloses the preheating of residual petroleum to liquefy them at a range of about 500 to 1000 degree F (C19/L18-23). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Soung with the preheating to the particular temperature range step to liquefy the petroleum residue feed of Leas for the purpose to provide proper atomization of the petroleum residua.

Koh et al., discloses the steam and recycled gas mixture in a catalytic gasification process to contains about 63% steam, 7.8% carbon monoxide, and 25.5% hydrogen (C15/L30-35) and wherein the flow rate of the steam (and other gases) is at a ratio of 0.2 – 5.0 and may be varied as desired (C11/L32-35) and the feedstock is maintained at 0.05 to 0.5 weight (in feed flow rate) of the alkali metal (C7/L41-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Soung in view of Leas with the process conditions of Koh et al., for the purpose to optimize the impregnation (contact) method of the alkali-carbon ratios (C7/L45-50 of Koh et al.).

Regarding claim 2, Soung discloses char particles containing carbonaceous material, ash and alkali metal residues are continuously withdrawn from the fluidized

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bed in gasifier 32 through transfer line 44 and introduced into slurry tank 46, and a slurry comprising an aqueous solution containing water-soluble alkali metal constituents introduced into the slurry tank through line 47 (maintaining conditions) (C6/L12-26).

Regarding claim 3, Soung discloses the alkali compounds are potassium or cesium hydroxides or carbonates (C1/L40-47).

Regarding claim 5, Soung discloses the gasifier 32 has a lower and upper section (wherein the fluidized particles move upward) and the gas leaving the fluidized bed in the gasifier 32 passes through the upper section which serves as a disengagement zone where the heavier particles are returned to the (lower section) bed (C5/L10-15; Fig. 1).

Regarding claim 6, Soung discloses fluidized particles are returned (circulated) to the gasifier 32 lower section via line 45 (a standpipe) and withdrawn via line 37 (a riser) from the upper section (C5/L18-31; Fig. 1).

Regarding claim 7, Soung discloses the feedstock is injected through aerated (riser) 26 via line 29 and 31 (C4/L22-28).

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soung, U.S. Patent No. 4,459,138 in view of Leas, U.S. Patent No. 5,855,631 and in further view of Koh et al, U.S. Patent No. 4,094,650 and further in view of Adsetts, U.S. Patent No. 3,926,584.

Regarding claim 4, Soung in view of Leas, and in further view of Koh et al. discloses all of the limitations as set forth in paragraph 1 above. Soung further discloses a series of spray nozzles (for dispersing) or similar devices (for providing agitation) 17

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for the spraying of alkali metal-containing solution supplied through line 18 onto the solids (feedstock) is from about 3% to 50% weight (C3/L59-65). Soung, in view of Leas, and in further view of Koh et al does not disclose dispersion at a concentration of 1% mass of the feedstock. Adsetts discloses that the alkali metal compound is preferably in a range of 0.25-0.75 weight percent of the feedstock (hydrocarbon). It would have been obvious to one of ordinary skill in the art to modify Soung in view of Leas, and in further view of Koh et al., with the process conditions of 0.25-0.75 weight percent of alkali to feedstock disclosed in Adsetts for the purpose to provide a process producing a gas containing substantial proportion of methane (C1/L11-13 of Adsetts).

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soung, U.S Patent No. 4,459,138 in view of Leas, U.S. Patent No. 5,855,631 and in further view of Koh et al, U.S. Patent No. 4,094,650 and further in view of Lomas, U.S. Patent No. 4,541,923.

Regarding claim 8, Soung in view of Leas, and in further view of Koh et al. discloses all of the limitations as set forth in paragraph 1 above. Soung further discloses the feedstock is injected through aerated (riser) 26 via line 29 and 31 to raise the input stream to the required pressure (C4/L22-28). Soung in view of Leas, and in further view of Koh et al. does not disclose the mass flow rate of the solids in the riser is 5-20 times the mass flow rate of the injected feedstock.

Lomas discloses passing hydrocarbons (feedstock) and catalyst (solids) flowing up through the riser at about 1.8-12.2 meters/second which may be optimized and adjusted, and a catalyst to hydrocarbon (feedstock) weight ratio is from about 5-10

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(indicating the process is operating wherein the ratio of the mass flow rate of the catalyst (solids) to the feedstock is 5-10)(C5/L55-59; C2/L35-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Soung in view of Leas, and in further view of Koh et al., with the process disclosed in Lomas for the purpose to provide smooth turbulent flow up through the riser section (C2/L42-44).

4. Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soung, U.S Patent No. 4,459,138 in view of Leas, U.S. Patent No. 5,855,631 and in further view of Koh et al, U.S. Patent No. 4,094,650 and further in view of Skaggs, U.S. Patent No. 5,628,623.

Regarding claim 9, Soung in view of Leas and in further view of Koh et al. discloses all of the limitations as set forth in paragraph 1. Soung further discloses that the gas is introduced into cyclone separator or similar device 38 for removal of the larger fines. The overhead gas then passes through line 39 into a second separator 41 where smaller particles are removed. The gas from which the solids have been separated is taken overhead from separator 41 through line 42 and the fines are discharged downward through diplegs 40 and 43. A portion of these fines is normally returned to the gasifier via line 45 (below the level of the feedstock injection via lines 29 and 31) (C5/L17-32). Soung in view of Leas does not explicitly disclose the use of a jet ejector for discharging the fine particles into the riser.

Skaggs discloses that a jet ejector that may be used for any liquid handling purposes (C1/L63-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Soung in view of Leas, with the jet ejector of

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Skaggs for the purpose to reduce the vulnerability to clogging of particulates entrained in the feedstock (C2/L3-5 of Skaggs).

5. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soung, U.S Patent No. 4,459,138 in view of Leas, U.S. Patent No. 5,855,631 and in further view of Koh et al, U.S. Patent No. 4,094,650 and further in view of Skaggs, U.S. Patent No. 5,628,623, and further in view of Machado et al., U.S. Patent No. 6,506,361.

Regarding claim 10, Soung in view of Leas, in further view Koh et al. and further in view of Skaggs discloses all of the limitations as set forth in paragraph 4 above. Soung in view of Leas, in further view Koh et al. and further in view of Skaggs does not disclose operate the ejector with sufficient force as to induce down flow of the gas/entrained solids in the dipleg 43 of separator 41 so that the gas/solids will flow downward with a velocity of more than 0.1 m/sec and less than 1 m/sec.

Machado et al. discloses a liquid motive gas (jet) ejector that provides superficial liquid velocity at 0.05 to 1.0 meters/second (C4/L28-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Soung in view of Leas, in further view Koh et al. and further in view of Skaggs with Machado et al. for the purpose to provide operating parameters for the jet ejector to enhance mixing of the liquids and control pressure in the system (C4/L44-48 of Machado et al.).

Conclusion

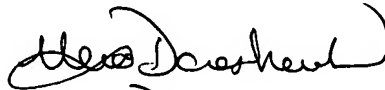
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinit H. Patel whose telephone number is (571) 272-0856. The examiner can normally be reached Monday – Friday from 9:00 am - 5:30

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pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached at (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vinit H. Patel
January 4, 2005


Alexa Doroshenk
Patent Examiner
Art Unit 1764